

DESCRIPTION	QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEEL LOCK STROBE 15 cd	—	0.5010	0.0000
WHEEL LOCK HORN/STROBE 15cd	—	0.0000	0.0000
WHEEL LOCK STROBE 30 cd	—	0.0300	0.0000
WHEEL LOCK HORN/STROBE 30 cd	—	0.0450	0.0000
WHEEL LOCK STROBE 75 cd	—	0.1650	0.0000
WHEEL LOCK HORN/STROBE 75 cd	—	0.1100	0.0000
WHEEL LOCK STROBE 110 cd	4	0.2200	0.8800
WHEEL LOCK HORN/STROBE 110 cd	3	0.3070	0.9210
WHEEL LOCK HORN	—	0.0000	0.0000
AUTOCALL BELL	4	0.0500	0.2000
AUTOCALL BELL/STROBE 75 cd	—	0.2150	0.0000
TOTAL NOTIFICATION APPLIANCES' CURRENT			2.0010

VOLTAGE DROP (VD) CALCULATIONS

$VD = \{ (I) (D) (21.6) \} / CM$
 WHERE: I = CIRCUIT CURRENT
 D = CONDUCTOR LENGTH (FT) ONE WAY
 21.6 = CONSTANT
 CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)

$VD = \{ (2.001A) (440FT) (21.6) \} / 4110 = 4.627V$
 $\%VD = \{ 4.627V / 24V \} \times 100 = 19.28\%$
 REMAINING VOLTS = 19.373

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

ITEM	DESCRIPTION	QTY	STANDY CURRENT PER ITEM (AMPS)	TOTAL STANDY CURRENT PER ITEM (AMPS)	ALARM CURRENT PER ITEM (AMPS)	TOTAL ALARM CURRENT PER ITEM
CP-35	FACP w/ 2ZN'S + AUD	1	0.1750	0.1750	0.5010	0.5010
PS-35	POWER SUPPLY	1	0.0000	0.0000	0.0000	0.0000
BC-35	BATTERY CHARGER	1	0.0450	0.0450	0.0300	0.0300
AA-30U	CLASS B BELL MODULE	1	0.0065	0.0065	0.0400	0.0400
PM-32	MATRIX MODULE	1	0.0000	0.0000	0.0000	0.0000
RM-30U	RELEASE MODULE	—	0.0050	0.0000	1.5000	0.0000
SM-30	SWITCH MODULE	3	0.0000	0.0000	0.0450	0.1350
SR-32	6 RELAY MODULE	—	0.0000	0.0000	0.0450	0.0000
SR-35	8 RELAY MODULE	2	0.0000	0.0000	0.0210	0.0420
TC-30U	BATTERY TRANSFER	—	0.0000	0.0000	0.0500	0.0000
TL-30U	TIME LIMIT	—	0.0300	0.0000	0.0150	0.0000
ZN-34US	SUPERVISORY MODULE	3	0.0100	0.0300	0.1100	0.3300
ZU-35	ZONE MODULE	1	0.0090	0.0090	0.1100	0.1100
ZU-35DS	ZONE MODULE/SD's	5	0.0090	0.0450	0.1100	0.5500
SMOKE	SMOKE DETECTOR	34	0.0034	0.0003	0.0010	0.0340
MOI	TRANSMITTER	1	0.1200	0.1200	0.1750	0.1750
MID	INPUT BOARD	2	0.0020	0.0040	0.0000	0.0000
PS-5A	POWER SUPPLY	1	0.0380	0.0380	0.0000	0.0000
TOTAL NOTIFICATION APPLIANCES CURRENT						3.5510
TOTAL SYSTEM CURRENT				STANDBY	ALARM	5.8230

MIN. BATTERY CAPACITY = {(TOT. STANDBY CURRENT X STANDBY TIME) + (TOT. ALARM CURRENT X ALARM TIME)} X 1.25

MIN. BATTERY CAPACITY = {(0.5559 A X 24 HR) + (5.823 A X 0.083 HR)} X 1.25

MIN. BATTERY CAPACITY = {13.3416 Ahr + 0.4833 Ahr} X 1.25 = 17.2811 Ahr

SYSTEM EVENT	RESPONSE								
	ANNUNCIATE AT FACU	FIRE SIGNAL TO RECEIVER	TROUBLE SIGNAL TO LBNL RECEIVER	SUPERVISORY SIGNAL TO LBNL RECEIVER	OPERATE 80.80A NOTIFICATION DEVICES	ELEVATOR RECALL	DAMPER RELEASE	AHU-6 SHUTDOWN	ROLL-UP DOOR RELEASE
80,80A FIRE CALL BOXES	●	●			●	●			
80 HEAT DETECTORS	●	●			●	●			
80 FACP SMOKE DETECTOR	●	●			●	●			
80 (AHU-6) DUCT SMOKE DETECTOR	●	●			●		●	●	
80 ELEVATOR SMOKE DETECTORS	●	●			●	●			
80-109 ROLL-UP DOOR SMOKE DETECTORS	●	●			●	●			●
80 FIRE SPRINKLER WATERFLOW SWITCHES	●	●			●	●			
80A FIRE SPRINKLER VALVE SUPERVISORY SWITCHES	●			●					
80A FIRE SPRINKLER WATERFLOW SWITCH	●				●				
80A FIRE SPRINKLER VALVE SUPERVISORY SWITCH	●			●					
AC POWER FAILURE	●		●						
SYSTEM FAULT	●		●						

CKT AV1: BASEMENT & 1ST FLR		QTY	CURRENT PER ITEM (AMPS)	TOTAL CURRENT PER ITEM
WHEELLOCK STROBE 15 cd	—	0.5010	0.0000	
WHEELLOCK HORN/STROBE 15cd	—	0.0000	0.0000	
WHEELLOCK STROBE 30 cd	—	0.0300	0.0000	
WHEELLOCK HORN/STROBE 30 cd	—	0.0450	0.0000	
WHEELLOCK STROBE 75 cd	—	0.165	0.0000	
WHEELLOCK HORN/STROBE 75 cd	—	0.1100	0.0000	
WHEELLOCK STROBE 110 cd	5	0.2200	1.1000	
WHEELLOCK HORN/STROBE 110 cd	—	0.1750	0.0000	
WHEELLOCK HORN	—	0.0000	0.0000	
AUTOCALL BELL	9	0.0500	0.0450	
AUTOCALL BELL/STROBE 75 cd	—	0.2150	0.0000	
TOTAL NOTIFICATION APPLIANCES CURRENT				1.5500

VOLTAGE DROP (VD) CALCULATIONS	
VD = {(I) (D) (21.6)}/{CM}	
WHERE: I = CIRCUIT CURRENT	
D = CONDUCTOR LENGTH (FT) ONE WAY	
21.6 = CONSTANT	
CM = WIRE CROSS-SECTIONAL AREA (CIRCULAR MILS)	
VD = {(1.55) (420FT) (21.64)}/{4110} = 3.421V	
%VD = {3.421V / 24V} X 100 = 14.255%	
REMAINING VOLTS = 20.579	

WIRE SIZE	CIRCULAR MILS
12AWG	6530
14AWG	4110
16AWG	2580
18AWG	1620
20AWG	1020

CKT AV1	BASEMENT & 1ST FLOOR	1.550
CKT AV2	2ND FLOOR	2.001
CKT AV3	—	—
CKT AV4	—	—
CKT AV5	—	—
CKT AV6	—	—
CKT AV7	—	—
CKT AV8	—	—
	TOTAL NOTIFICATION APPLIANCES CURRENT	3.551

PROFESSIONAL SEAL (IF REVISION, APPLIES ONLY TO REVISED WORK)	ISSUE (PROCESS, ESTIMATE, BID, CONSTRUCTION, CONFORMED, REVISION, RECORD)	AS BUILT — — 10/23/13					80, 80A FIRE ALARM SYSTEM FUNCTION CHART & CALCULATIONS					DRAWN BY LDD DATE 10/23/2013		
												CHECKED BY LDD 10/23/2013		
												APPROVED BY MCD 10/23/2013		
												SCALE AS NOTED		
												DRAWING NO. 4B80E097_		
		REVISION NUMBER	DRAWN BY	CHECKED BY	APPROVED BY	DATE	REMARKS	UNIVERSITY OF CALIFORNIA LAWRENCE BERKELEY NATIONAL LABORATORY FACILITIES DIVISION					SHEET FA	
		—	LDD	LDD	MCD	10/23/13	AS BUILT						PROJECT NO. 000000 1 OF 1	